

PATENT

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Claims:

1. A method for processing a substrate, comprising:
plating a conductive layer onto a substrate;
transferring the substrate from a plating cell to a cleaning cell;
heating the substrate in the cleaning cell;
transferring the substrate from the cleaning cell to an annealing station; and
annealing the substrate at the annealing station at a temperature of between about 150°C and about 450°C.
2. The method of claim 1, wherein heating the substrate comprises applying a rinsing solution having a temperature of between about 50°C and about 100°C.
3. The method of claim 1, wherein heating the substrate comprises applying a rinsing solution having a temperature of between about 75°C and about 100°C and drying the substrate in the cleaning cell.
4. The method of claim 3, further comprising rotating the substrate at a rate of between about 10 rpm and 500 rpm.
5. The method of claim 1, wherein heating the substrate comprises radiating the substrate while a rinsing fluid is dispensed thereon.
6. The method of claim 1, wherein a timeframe between drying the substrate and annealing the substrate is between about 20 seconds and about 60 seconds.
7. The method of claim 1, wherein a duration of the drying is between about 5 seconds and about 25 seconds.
8. A method of processing a substrate, comprising:
plating a conductive layer onto a substrate;
rinsing the substrate of unwanted residue chemicals;

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preheating the substrate during the rinsing process to a temperature of between about 50°C and about 100°C; and

annealing the substrate at an annealing station at a temperature of between about 150°C and about 450°C subsequent to the preheating process.

9. The method of claim 8, wherein rinsing and preheating are conducted in a spin rinse dry cell.

10. The method of claim 9, wherein heating comprises dispensing a heated rinsing solution onto the substrate.

11. The method of claim 10, wherein the heated rising solution comprises deionized water at a temperature of between about 50°C and about 100°C.

12. The method of claim 9, further comprising transferring the substrate from the spin rinse dry cell to the annealing station when the preheating is finished, the transferring process having a duration of between about 20 seconds and about 60 seconds.

13. The method of claim 8, wherein preheating the substrate comprises applying radiant heat to the substrate during the rinsing.

14. The method of claim 8, wherein the rinsing and preheating steps are conducted simultaneously.

15. The method of claim 8, further comprising controlling a temperature of a rinsing fluid to remain at a constant temperature.

16. The method of claim 15, further comprising reading a temperature of a heated solution with a thermocouple and controlling a heater positioned in communication

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with the rinsing solution in accordance with a temperature indicated by the thermocouple.

17. An apparatus for processing a substrate, comprising:

a plating cell positioned on a processing platform, the plating cell being configured to plate a conductive layer onto the substrate;

a rinsing cell positioned on the processing platform, the rinsing cell comprising:

a substrate support member configured to support the substrate for processing;

a fluid dispensing nozzle positioned to dispense a rinsing solution onto the substrate; and

a fluid heating assembly positioned in fluid communication with the fluid dispensing nozzle, the fluid heating assembly being configured to supply a heated rinsing solution at a temperature of between about 50°C and about 100°C; and

a substrate annealing station positioned in communication with the processing platform.

18. The apparatus of claim 17, wherein the rinsing cell is configured to dispense the heated rinsing solution onto the substrate during a spin rinse dry process.

19. The apparatus of claim 18, further comprising a substrate transfer robot positioned on the processing platform, the substrate transfer robot being configured to transfer the substrate from the rinsing cell to the annealing station in less than about 15 seconds.

20. The apparatus of claim 18, wherein the substrate heating assembly comprises a fluid tank having a controllable heating element therein, the heating element being configured to maintain fluid in the tank at a predetermined temperature.